BEFORE

THE PUBLIC SERVICE COMMISSION OF

SOUTH CAROLINA

DOCKET NO. 97-239-C-ORDER NO. 98-322

MAY 6, 1998

IN RE: Proceeding to Establish Guidelines) ORDER ON UNIVERSAL
       for an Intrastate Universal Service) SERVICE COST MODELS
       Fund   )

I. PROCEDURAL BACKGROUND

This matter comes before the South Carolina Public Service

Commission ("Commission") in connection with the Commission's

obligations under S.C. Code Ann. § 58-9-280(E) (Supp. 1997) to

establish an intrastate universal service fund ("USF") for

distribution to carriers of last resort. Further, as discussed

below in more detail, this matter comes before the Commission in

connection with its obligations under federal law to select a

cost proxy model for use in calculating interstate support for

non-rural incumbent local exchange carriers ("ILECs") serving

rural, insular and high cost areas in South Carolina. On May 29,

1997, in response to this statutory obligation, the Commission

issued a Notice of Proceeding creating a proceeding to establish

guidelines as may be necessary for the funding and management of

the USF including issues related to the size of the USF. The

Commission assigned Docket No. 97-239-C to the matter.

Numerous parties intervened in Docket No. 97-239-C including

BellSouth Telecommunications, Inc. ("BellSouth"), the Consumer

Advocate for the State of South Carolina ("Consumer Advocate"),

the South Carolina Cable Television Association ("SCCTA"), MCI

Telecommunications Corporation ("MCI"), South Carolina Public

Communications Association ("SCPCA"), John C. Ruoff, Ph.D.

("Ruoff"), American Communications Services, Inc. ("ACSI"), AT&T

Communications of the Southern States, Inc. ("AT&T"), South

Carolina Budget and Control Board, Office of Information

Resources ("OIR"), Worldcom, Inc. ("Worldcom"), Alliance for

South Carolina's Children ("Alliance"), Parents Reaching Out to

Parents of South Carolina, Inc. ("PRO-Parents"), GTE South

Incorporated ("GTE"), South Carolina Fair Share and the Women's

Shelter ("SC Fair Share"), LCI International Inc. ("LCI"), South

Carolina Telephone Association ("SCTA"), South Carolina Telephone

Coalition ("SCTC"), and United Telephone Company ("United").

In Order No. 97-516, dated June 13, 1997, the Commission

clarified that an intrastate USF fund would be established in the

following manner. First, the Commission would establish

guidelines for the fund, including estimating the size of the

level of support to be trued up or down after the Commission

determines the actual methodology to be used. Second, the

Commission stated it would hold a separate hearing to accept and

evaluate evidence regarding specific methodologies to be used in determining the actual size of the intrastate USF. Order No. 97-516.

An initial public hearing in this docket was held on August 4, 1997. In Order No. 97-753, dated September 3, 1997, the Commission addressed the USF guidelines, adopted with certain modifications the guidelines proposed by the SCTA, and deferred ruling on certain sections. Pursuant to the requirements of S.C. Code Ann. § 58-9-280(E)(4), the Commission estimated the size of the USF to be $439.7 million. In Order No. 97-942, dated December 31, 1997, the Commission granted in part and denied in part various petitions for rehearing and/or reconsideration of Order No. 97-753, emphasizing that the actual size of the USF would be determined de novo in future Commission proceedings. In Order No. 98-201, dated March 17, 1998, the Commission granted reconsideration in part of Order No. 97-942, reinstating certain parts of Order No. 97-753 which had been deleted in Order No. 97-942.

In Order No. 97-958, dated November 24, 1997, the Commission designated BellSouth, United, GTE and the member companies of the South Carolina Telephone Coalition as telecommunications carriers eligible to receive universal service support under section 214(e)(2) of the Telecommunications Act of 1996.

A second public hearing in this docket was held on November 19, 1997, for the limited purpose of receiving testimony and permitting cross-examination of SCTA witnesses Alphonso Varner and Keith Oliver, and SCTC witnesses Azita Sparano, and Douglas Meredith, pursuant to Commission Order No. 97-1001, dated November 20, 1997. The hearing was thereafter recessed until a later date, and ultimately reconvened on March 9, 1998. The public hearing concluded on March 11, 1998.

During the USF hearings, BellSouth was represented by Caroline N. Watson, William F. Austin, J. Phillip Carver, William J. Ellenberg, II and Edward L. Rankin, III. BellSouth presented the testimony of Dr. Randall S. Billingsley, G. David Cunningham, Peter F. Martin, D. Daonne Caldwell, Jamshed K. Madan, Michael D. Dirmeier, and David C. Newton.

United was represented by Richard Whitt and James Wright. United presented the testimony of Jerome C. Weinert, Wayne Jones, Dr. Brian Staihr, and Steve Parrott.

BellSouth and United jointly presented the testimony of Dr. Kevin Duffy-Deno, Dr. Robert Bowman, and Dr. Brian Staihr.

SCTA and SCTC were represented by M. John Bowen, Jr. and Margaret Fox. SCTA presented the testimony of Alphonso Varner and Keith Oliver. The SCTC presented the testimony of Azita

Sparano and Douglas Meredith. The SCTA and SCTC witnesses testified on November 19, 1997.

The Consumer Advocate was represented by Elliott F. Elam, Jr. The Consumer Advocate presented the testimony of John B. Legler and Allen G. Buckalew.

MCI was represented by John M. S. Hoefer, and Paige Gossett. MCI presented the testimony of Thomas Hyde.

AT&T was represented by Francis P. Mood, Robin Dunson, Steve A. Matthews and Steven Ruscus. AT&T presented the testimony of James W. Wells, Brian F. Pitkin, Art Lerma, Richard Guepe, David L. Kaserman, Mike Guedel, Don Wood, James W. Currin, and John I Hirshleifer.

GTE was represented by Steven W. Hamm, Joe Foster, Ed Fuhr and Rich Harper. GTE presented the testimony of Gregory Jacobson, Allen E. Sovereign, Michael R. Norris, Dr. Timothy J. Tardiff, Mark S. Calnon, and Francis Murphy.

SCPCA was represented by John F. Beach. SCPCA presented the testimony of Walter Rice.

ACSI was represented by Russell B. Shetterly. ACSI presented no witnesses.

SCCTA was represented by B. Craig Collins. SCCTA presented no witnesses.

The Commission's Staff was represented by F. David Butler.

The Commission Staff presented no witnesses during this phase of

the proceeding.

II. SUMMARY OF TESTIMONY

ALPHONSO J. VARNER

The SCTA presented the direct testimony of Alphonso J.

Varner, Senior Director for State Regulatory for BellSouth

Telecommunications, Inc. Mr. Varner addressed the general topic

of universal service and what the SCTA should do to ensure it is

preserved in South Carolina. Mr. Varner addressed policy issues

regarding USF. Mr. Varner outlined costing principles developed

by the SCTA which he testified were consistent with the

Telecommunications Act of 1996 as well as the Federal

Communications Commission's ("FCC") May 8, 1997 Report and Order

in Docket No. 96-45. Mr. Varner also testified as to the

guidelines approved by the Commission in its Order No. 97-757 as

well as the modifications proposed by the SCTA in Sections 9 and

11 which were deferred in the initial universal service

proceeding.

H. KEITH OLIVER

The SCTA presented the direct testimony of Keith J. Oliver,

Vice-President Finance, Home Telephone Company, Inc. Mr. Oliver

testified about the administrative procedures developed by the

SCTA for use in the USF guidelines.

DOUGLAS MEREDITH

The SCTC presented the direct testimony of Douglas Meredith.

Mr. Meredith is the Director of Economics and Pricing Division of

John Staurulakis, Inc. (JSI) in Alpharetta, Georgia. Mr.

Meredith testified regarding the treatment of costs for rural

carriers in South Carolina. He testified to the methodology used

to determine the size of the intrastate USF for those companies

as listed. All these companies are incumbent local exchange

carriers ("ILECs") who have carrier of last resort (COLR) status

within South Carolina.

AZITA SPARANO

The SCTC presented the direct testimony of Ms. Sparano. Ms.

Sparano is Director of Southeast Operations of John Staurulakis

Inc. (JSI) of Alpharetta, Georgia. Ms. Sparano testified as to a

detailed outline of the embedded cost methodology as described by

witness Meredith. She also presented the result of the

application of that methodology for the SCTC Company.

RANDALL BILLINGSLEY

Dr. Billingsley, a finance professor at Virginia Polytechnic

Institute and State University, filed rebuttal testimony on

behalf of BellSouth. Prior to the hearing, the parties agreed to

stipulate to Dr. Billingsley's rebuttal testimony into the record. The Commission approved the stipulation. Dr. Billingsley attempted to rebut the testimony of John I. Hirshleifer and a statement of Matthew I. Kahal which was relied upon by Don Wood in his testimony. Mr. Hirshleifer and Mr. Wood testified on behalf of AT&T.

Specifically, Dr. Billingsley testified that Hirshleifer erroneously estimated BellSouth Corporation's cost of equity to be only 10.99% to 11.05% and BellSouth Telecommunications, Inc.'s ("BST") overall cost of capital to be only 9.43%. Dr. Billingsley's testimony included an explanation of the errors and inconsistencies in Hirshleifer's discounted cash flow ("DCF") and capital asset pricing model ("CAPM") analyses of BellSouth Telecommunications, Inc.'s cost of equity capital. Dr. Billingsley determined an overall cost of capital for BST of 11.25%. Dr. Billingsley also attempted to rebut Kahal's cost of capital analysis for LECs as being unrealistically low.

G. DAVID CUNNINGHAM

BellSouth presented the rebuttal testimony of G. David Cunningham, Director of Finance for BellSouth. Prior to the hearing, the parties agreed to stipulate Cunningham's rebuttal testimony into the record. The Commission approved the stipulation. Mr. Cunningham testified in response to the direct

testimony of James W. Currin on behalf of AT&T regarding the economic lives used in BellSouth's calculation of universal service costs. Mr. Cunningham testified as to the appropriateness of the forward-looking economic lives developed by BellSouth's Depreciation organization and provided for use in BellSouth's first study using the BCPM 3.1 Model.

JAMES W. CURRIN

AT&T presented the direct and rebuttal testimony of Mr. James W. Currin. Mr. Currin is a Senior Consultant of the economic consulting firm of Snavely King Majoros O'Connor & Lee, Inc. in Washington, DC. Prior to the hearing, the parties agreed to stipulate Mr. Currin's direct and rebuttal testimony into the record. The Commission approved the stipulation. Mr. Currin testified that he was responding to the testimony of Daonne Caldwell who presented the depreciation lives proposed by BellSouth, and Michael Norris and Allen E. Sovereign, who presented the lives used by GTE South. Mr. Currin testified that he compared these lives to those appropriate for universal cost calculations pursuant to the Commission Order of September 3, 1997 and to the lives used in the Hatfield Model.

Mr. Currin testified as a rebuttal witness to the testimony of G. David Cunningham (BellSouth) on the subject of the appropriate economic lives and future net salvage percents to be

used in calculating depreciation pursuant to the Universal

Services Order of the FCC.

JOHN I. HIRSHLEIFER

AT&T presented the direct and rebuttal testimony of John I.

Hirshleifer, Vice President and Director of Research of FinEcon

of Los Angeles, California. Prior to the hearing, the parties

agreed to stipulate Mr. Hirshleifer's direct and rebuttal

testimony into the record. The Commission approved the

stipulation.

Mr. Hirshleifer testified as to the estimate of the forward-

looking cost of capital that should be used in determining the

telephone subsidiaries of GTE and BellSouth and for United

Telephone Company of the Carolinas, and the forward looking cost

of capital appropriate for the provision of universal service.

Mr. Hirshleifer testified that the midpoint of his cost of

capital range for the provision of universal services is 9.43%

for BellSouth and 9.60% for GTE and 9.53% for United.

AT&T presented Mr. Hirshleifer to attempt to rebut

BellSouth's proposal to adopt a 11.25% cost of capital. Mr.

Hirshleifer also testified as a rebuttal witness to the testimony

of Dr. Billingsley.

THOMAS HYDE

MCI presented the direct testimony of Thomas Hyde. Mr. Hyde is a consultant for MCI. Prior to the hearing, the parties agreed to stipulate Mr. Hyde's direct and revised direct testimony into the record. The Commission approved the stipulation. Mr. Hyde testified as to certain aspects of the testimony of Douglas Meredith filed by the SCTC.

GREGORY D. JACOBSON

GTE presented the rebuttal testimony of Gregory D. Jacobson, Vice President and Treasurer of GTE Telephone Operating Companies. Prior to the hearing, the parties agreed to stipulate Mr. Jacobson's rebuttal testimony into the record. The Commission approved the stipulation. Mr. Jacobson testified in support of the capital structure and overall weighted average cost of capital (WACC) used in the cost studies presented by GTE. Mr. Jacobson testified that the WACC reflects forward-looking costs consistent with prevailing economic theory. Mr. Jacobson also attempted to rebut certain issues raised in the direct testimony of John I. Hirshleifer on behalf of AT&T. Mr. Jacobson testified that Mr. Hirshleifer had made certain arbitrary assumptions and modifications to the application of the DCF, CAPM and capital structure that are inconsistent with prevailing economic theory and which individually and

collectively bias Mr. Jacobson's results and understate the

forward-looking cost of capital for GTE South.

DAVID L. KASERMAN

AT&T presented the direct testimony of David L. Kaserman, an

economist, employed as Torchmark Professor of Economics at Auburn

University. Prior to the hearing, the parties agreed to stipulate

Dr. Kaserman's direct testimony into the record. The Commission

approved the stipulation. Dr. Kaserman described some

fundamental economic principles that apply to issued raised by

the Commission's current efforts to reform the system through

which the policy objective of universal service is pursued. Dr.

Kaserman testified that these principles are useful both in

describing the overall characteristics that should be

incorporated in the new system and in guiding the selection of an

appropriate cost model for use in operating that system.

JOHN LEGLER

The Consumer Advocate presented the surrebuttal testimony of

John Legler, Professor of Banking and Finance from the University

of Georgia. Prior to the hearing, the parties agreed to stipulate

Dr. Legler's surrebuttal testimony into the record. The

Commission approved the stipulation. Dr. Legler testified in his

surrebuttal testimony that BellSouth Telecommunications had a

rate of return of common equity of 11.00% and GTE had a rate of
return on common equity of 11.80%.

WALTER RICE

The South Carolina Public Communications Association (SCPCA)
presented the direct testimony of Walter Rice. Mr. Rice is
President of R&R Communications and is the President of the South
Carolina Public Communications Association (SCPCA). Prior to the
hearing, the parties agreed to stipulate Mr. Rice's direct
testimony into the record. The Commission approved the
stipulation. Mr. Rice testified as to the appropriate way in
which Payphone Service Providers ("PSPs") should contribute to
Universal Service in South Carolina.

ALLEN SOVEREIGN

GTE presented the rebuttal testimony of Allen E. Sovereign.
Mr. Sovereign is employed by GTE Telephone Operations as Manager-
Capital Recovery in Texas. Prior to the hearing, the parties
agreed to stipulate Mr. Sovereign's rebuttal testimony into the
record. The Commission approved the stipulation. Mr. Sovereign
attempted to rebut the direct testimony of James W. Currin.

JEROME C. WEINERT

United presented the rebuttal testimony of Jerome C.
Weinert, Vice President of Associated Utility Services, Inc. of
Wisconsin. Prior to the hearing, the parties agreed to stipulate

Mr. Weinert's rebuttal testimony into the record. The Commission

approved the stipulation. Mr. Weinert testified as to the

appropriateness of the depreciation lives and net salvage factors

to be utilized by United in its model (BCPM 3.1) for determining

the cost of telecommunications services that should be supported

by the universal service funding mechanism and to attempt to

rebut evidence presented by intervenors to this proceeding

contrary to United's proposed depreciation parameters.

BRIAN K. STAIHR

BellSouth and United presented the direct, revised direct

and rebuttal testimonies of Brian K. Staihr. Mr. Staihr is a

regulatory economist with Sprint United Management Company in

Kansas. Mr. Staihr testified regarding the proper costing

methodology that should be used in determining explicit universal

service support for the state of South Carolina. Mr. Staihr

testified that the costing methodology should be the Benchmark

Cost Proxy Model. Mr. Staihr testified in his rebuttal testimony

as to certain issues raised in the direct testimonies of AT&T

witnesses Don Wood and Jim Wells. Mr. Staihr testified that

these issues deal specifically with the Hatfield Model Version

5.0a and also presented a sensitivity analysis of key inputs to

both models filed, Hatfield 5.0a and BCPM 3.1.

KEVIN T. DUFFY-DENO

BellSouth and United presented the direct and rebuttal testimony of Kevin T. Duffy-Deno, Managing Director-Market Research at INDETEC, International in Utah. Dr. Duffy-Deno testified, along with Dr. Robert Bowman, in lieu of Dr. Richard D. Emmerson's testimony, about the BCPM.

Dr. Duffy-Deno testified in response to testimony filed by AT&T in support of a new release of the Hatfield Model, Release 5.0a. Dr. Duffy-Deno testified specifically regarding Don Wood's assertions regarding HM 5.0a.

ROBERT M. BOWMAN

BellSouth and United presented the direct and rebuttal testimony of Robert M. Bowman, an independent telecommunications consultant from Colorado. Dr. Bowman testified in lieu of Dr. Richard B. Emmerson, explaining the BCPM. Dr. Bowman testified that, from an engineering perspective, the BCPM Version 3.1 is the appropriate model to rely upon in estimating the costs of universal service for BellSouth and United's territory in South Carolina. Dr. Bowman testified as to its forward-looking network for efficient universal service. Dr. Bowman also testified as to how the BCPM 3.1 integrates its customer location methodology with its network design to ensure that engineering design and constraints reflect the underlying customer location data.

PANEL BY WAYNE H. JONES AND DR. BRIAN STAIHR

United presented the direct panel testimony of Wayne H.

Jones, Manager of Service Costing for Sprint-Mid-Atlantic in

North Carolina and Dr. Brian Staihr, Regulatory Economist, Sprint

United Management Company in Kansas. The panel testified as to

United's use of the BCPM, Version 3.1 for determining the cost of

providing Universal Service in South Carolina.

CHARLES S. PARROTT

United presented the direct testimony of Steve Parrott,

Sprint's Mid-Atlantic Operations Director - Regulatory Affairs,

North Carolina. Mr. Parrott testified as to the results and

calculations supporting United's requirement for explicit

universal service support in South Carolina and to share certain

of the policy views of Sprint on critical universal service

issues.

DAONNE CALDWELL

BellSouth presented the revised direct and supplemental

direct testimony of Daonne Caldwell, Director of Finance for

BellSouth Telecommunications, Inc. On Tuesday, March 10, 1998,

due to a sudden family illness, the parties agreed to stipulate

as to Ms. Caldwell's testimony with the understanding that the

cross-examination of her in the jurisdictions of Alabama and

Louisiana also be received into the record. The Commission

approved the stipulation. Ms. Caldwell's filed testimony
explained and supported BellSouth's cost methodology for
calculating universal service costs. Ms. Caldwell's testimony
was that BellSouth had determined that the BCPM Version 3.1 most
closely reflects the cost of providing universal service to
BellSouth's South Carolina customers. Subsequently BellSouth
filed universal service cost studies based on BCPM 3.1, which
included refinements to the digital loop carrier and
feeder/distribution interface calculations; feeder cable
calculation to provide for cable requirements to handle
unoccupied housing units; distribution cable costs associated
with the limitation of quadrant cable lengths and switching fixed
costs.

MICHAEL NORRIS

GTE presented the direct, updated supplemental direct and
revised updated supplemental direct testimony of Michael R.
Norris, GTE Service Corporation Manager - Cost Models and Methods
Development, Texas. Mr. Norris' direct testimony addresses why
company-specific costs studies are appropriate for estimating
both the costs of unbundled network elements and universal
service support requirements. Mr. Norris' also testified as to
why cost proxy models are not appropriate. Mr. Norris also
testified as to GTE's integrated Cost Model (ICM) which he

testified was the appropriate model to estimate GTE's costs for

both the determining of rates for unbundled network elements

(UNEs) and universal service support requirements. However, the

ICM was not available for consideration in this proceeding.

GTE presented Mr. Norris' updated testimony. Mr. Norris'

testimony supported of a new version of the BCPM, Version 2.5.

Mr. Norris testified to his revised results of the new release of

BCPM 3.1.

GTE presented Mr. Norris' revised supplemental direct

testimony. Mr. Norris' testimony provided revised results of BCPM

3.1 based on a corrected understanding of cable sizing function

for distribution plant. Mr. Norris testified the change results

in a decrease of the Company's cost per line estimate.

MARK S. CALNON

GTE presented the direct, supplemental, updated supplemental

direct, revised updated supplemental direct and rebuttal

testimonies of Mark S. Calnon, Director of Pricing and Tariffs

for GTE Service Corporation in Texas. Mr. Calnon testified in

his direct testimony of the implications of removing the implicit

subsidies contained in the incumbent local exchange carriers

(ILECs) rates consistent with Section 254(f) of the

Telecommunications Act of 1996.

Mr. Calnon's supplemental testimony provided an update to the universal service funding for GTE. The change was a direct result of an updated analysis using the BCPM Version 2.5 model.

Mr. Calnon's updated supplemental direct testimony updated the direct result of an updated BPCM Version 3.1 model.

Mr. Calnon provided revised updated supplemental testimony updating a change in the result of an input correction to the BCPM Version 3.1. All changes are explained in Mr. Norris' revised updated supplemental direct testimony.

Mr. Calnon's rebuttal testimony was filed to address the issues raised by AT&T witnesses Kaserman, Guepe and Guedel and Bucklew on behalf of the Consumer Advocate.

DON J. WOOD

AT&T presented the direct and supplemental direct testimonies of Don J. Wood, consultant from Georgia. Mr. Wood testified as to Release 4 of the Hatfield Model sponsored by AT&T. Mr. Wood also testified as to the results of the model run to determine universal service funding requirements for each tier I ILEC in South Carolina. In addition, Mr. Wood testified as to the results of analysis of switching cost assumptions used by Sprint and BellSouth in their costing model.

Mr. Wood's supplemental direct testifies as to the release of the Hatfield Model 5.0a.

JAMES W. WELLS, JR.

AT&T presented the direct and supplemental testimonies of James W. Wells, Jr., District Manager - Outside Plant Cost Engineering for AT&T. Mr. Wells testified to the OSP inputs to the local loop portion of the Hatfield Model; his analysis of modifications to the OSP of the BCPM 2.0; rebuttal testimony to specific portions of direct testimony of BST and GTE's witnesses and address criticisms of the Hatfield Model.

Mr. Wells' supplementally testified as to the enhancements of OSP modeling methodology and input values as to the local loop portions of the Hatfield Model and validation as to the input values.

BRIAN F. PITKIN

AT&T presented the rebuttal testimony of Brian F. Pitkin, consultant with Klick, Kent & Allen, Inc. of Virginia. Mr. Pitkin testified as to the BCPM Release 3.1 submitted by BellSouth and GTE. Mr. Pitkin testified as to the comparison of the BCPM and Hatfield Model presented by Don Wood.

ART LERMA

AT&T presented the rebuttal testimony of Art Lerma, Regional Regulatory Chief Financial Officer for AT&T. Mr. Lerma testified as to the calculations of BellSouth's operating expenses that were populated in the BCPM 3.1 Model. Mr. Lerma also testified

as to GTE's operating expenses as populated by the BCPM 3.1

Model. Mr. Lerma's direct testimony addressed the expenses based

on BCPM 2.0.

RICHARD GUEPE

AT&T presented the supplemental direct testimony of Richard

Guepe, District Manager, Law & Government Affairs, Georgia. Mr.

Guepe testified as to the present universal service subsidy

requirements developed from the Hatfield Model for BellSouth,

United and GTE territories in South Carolina; the revenue

benchmark and cost inputs necessary to calculate the universal

service subsidy requirements; respond to GTE witness Calnon's

request for "interim" surcharges; address the mechanism for

recovery of USF contributions and additional requirements to

achieve a competitively neutral USF.

MIKE GUEDEL

AT&T presented the direct testimony of Mike Guedel, Manager

Network Services, AT&T, Georgia. Mr. Guedel testified as to the

elimination of CCLC charges and the reduction of access charges

to a level to the forward looking economic cost incurred by the

companies in providing access services.

ALLEN BUCKALEW

The Consumer Advocate presented the direct and supplemental

testimony of Allen Buckalew, economist, J. W. Wilson &

Associates, Washington, DC. Mr. Buckalew testified as to whether

the fund methods proposed by the LECs are consistent with the

federal rules for the USF. Mr. Buckalew also testified as to his

analysis of the cost studies presented by the LECs in support of

the USF.

MICHAEL D. DIRMEIER, DAVID C. NEWTON AND JAMSHED K. MADAN

Mr. Dirmeier and Mr. Madan are principals in the Georgetown

Consulting Group ("Georgetown"). Mr. Newton is an independent

consultant currently employed by Georgetown. As a panel, these

three witnesses (collectively, "Georgetown") filed rebuttal

testimony on behalf of BellSouth. Georgetown testified that the

inputs selected by AT&T for use in the Hatfield Model were

inappropriate for determining the cost of providing basic local

service in South Carolina. Specifically, Georgetown testified

that the default values selected by AT&T, particularly for

sensitive user adjustable inputs ("SUAIs") do not reflect the

conditions of BellSouth in South Carolina and do not reflect cost

or other conditions reasonably expected to occur in the future.

Georgetown selected alternative values for SUAIs which more

accurately reflected the conditions in South Carolina.

TIMOTHY J. TARDIFF

GTE presented the rebuttal testimony of Timothy J. Tardiff,

Vice President at National Economic Research Associates of

Massachusetts. Dr. Tardiff testified as to his economic and

engineering criticisms of the Hatfield Model. Dr. Tariff also

responded to the direct testimony of Mr. Don Wood.

FRANCIS J. MURPHY

GTE presented the rebuttal testimony of Francis J. Murphy.

Mr. Murphy is employed by Network Engineering Consulting, Inc. in

Massachusetts. Mr. Murphy testified that he had analyzed and

evaluated the various versions of the Hatfield Model in order to

determine whether the Model is appropriate to use in establishing

universal service obligations or in estimating costs or prices

for unbundled network elements. Mr. Murphy testified that the

Hatfield Model is subject to a myriad of economic and engineering

flaws that are so severe so as to render the Model unusable for

its intended purpose.

III. OVERVIEW OF UNIVERSAL SERVICE

Prior to discussing its findings and conclusions in this

matter, the Commission finds it necessary to provide an overview

of the fundamental changes in federal and state law that serve as

a backdrop for the Commission's decision. One of the central

challenges Congress faced in drafting the Telecommunications Act

of 1996 ("Act") was how to open a new era of competition in local

telephone service without jeopardizing the continued availability

of what is known as "universal service." Universal service

refers to a nationwide telecommunications policy of ensuring

access to certain basic telephone service for all Americans at

affordable rates.

Prior to the Act, universal service was supported by a

complex system of inter-customer and inter-service subsidies

administered in part by state public utility commissions and in

part by the FCC. Under this old regime, universal service was

supported primarily by requiring ILECs to charge some customers

(typically urban and business customers) above-cost rates so that

they could charge other customers (typically rural and

residential customers) rates that were below cost. Additional

sources of subsidies have traditionally included services such as

toll services and access charges. Access charges are the fees

that both long distance carriers and end-user customers pay for

using a local telephone company's network of lines and switches

for terminating or originating long distance calls. Businesses

or individuals that make many long distance calls help subsidize

those persons who primarily make local calls.

This extensive system of implicit subsidies (i.e., subsidies

embedded in an ILEC's rates) was feasible in the past, because

local telephone service was primarily provided through a system

of exclusive franchises granted and administered by the states.

Before the Act, a single telephone company under rate-of-return

regulation typically provided local service for a specified geographic territory under an exclusive, state-granted franchise. For its part, the telephone company agreed to invest enormous sums required to build and maintain a state-of-the-art telephone network and to assume the obligation to serve all customers within its service territory at rates regulated by the state. In return, state regulators set rates that were designed to ensure that the telephone company would be paid for the cost of providing service and would have the opportunity to earn a reasonable return on the capital invested in the network. Because state regulators could control the rates charged to all customers, and because (for the most part) the incumbent telephone company faced no competition within its service area for basic local exchange service, the state could maintain this extensive system of inter-customer and inter-service subsidies to advance its universal service goals while still allowing the telephone company a reasonable chance to recover its costs and earn a fair rate of return.

In the Act, however, Congress abolished exclusive franchises in favor of competition. In doing so, Congress recognized that the implicit cross subsidies that have traditionally supported universal service could not be sustained in a competitive marketplace. Competitors who have no obligation to serve all

residents in the market will naturally target those customers who

are charged above-cost rates or who provide a greater than

average amount of revenues, and will easily undercut those rates.

As a result, either the ILEC would be forced to lower its above-

cost rates to meet competition or it would simply lose the high

margin customers that currently support universal service.   In

either event, the ILEC would lose the source of funding that

supports universal service. Accordingly, given the loss of

universal service support from implicit subsidies, subsidized

local rates would have to rise substantially to reflect the

actual costs of providing service in the fully competitive

environment created by elimination of exclusive franchises.   To

introduce competition in all markets while protecting universal

service, Congress had to reshape fundamentally the funding of

universal service.

To that end, Congress gave specific instructions in the Act

concerning the form that the new universal service system should

take. First, Congress set forth the key principles that the FCC

and a special Federal-State Joint Board should follow in

establishing a new fund. Thus, the Act states that "[c]onsumers

in all regions of the Nation, including low-income consumers and

those in rural, insular, high cost areas, should have access to

telecommunications and information services" and that the federal

mechanism "should be specific, predictable and sufficient."

Section 254(b)(3), (b)(5) (emphasis added). Congress further

directed the FCC, in consultation with the Joint Board, to

establish a "definition of the services that are supported by

Federal universal service support mechanisms." Section

254(c)(1). The new funding system would be designed to support

this defined set of basic services.

In express terms, Congress mandated that the new system

"should be explicit and sufficient to achieve the purposes of

this section." Section 254(e) (emphasis added). Congress

recognized that only a system that makes universal service

support explicit--not a system that continues to rely on implicit

subsidies built into retail rates--will be sustainable, and thus

"sufficient" in a competitive marketplace. In addition, Congress

specified that "[e]very telecommunications carrier that provides

interstate telecommunications services shall contribute, on an

equitable and nondiscriminatory basis, to the specific,

predictable, and sufficient mechanisms established by the [FCC]

to preserve and advance universal service." Section 254(d).

Similarly, in Section 254(f), Congress directed that the states

should establish mechanisms for supporting universal service that

would be consistent with the new competitive environment and thus

required that "[e]very telecommunications carrier shall

contribute, on an equitable and nondiscriminatory basis, in a

manner determined by the State to the preservation and

advancement of universal service in that State." Through these

requirements, Congress sought to ensure that the new universal

service funding system--unlike the existing system of implicit

subsidies--would not create regulatory distortions that

artificially advantage some carriers over others in the

competitive marketplace.

Congress also sought to ensure that funding from the new

federal mechanism would be available only to carriers that

actually undertook the task of providing basic services to

residents in the rural, insular and high cost areas that

typically require universal support. Thus, Section 254(e) of the

Act specified that a common carrier may be designated as

"eligible" to receive support only if "throughout the service

area for which the designation is received," the carrier

"offer[s] the services that are supported by Federal universal

service support mechanisms under Section 254(c)" and

"advertise[s] the availability of such services and the charges

therefor using media of general distribution." The clear

objective of these requirements is to ensure that a carrier will

receive a subsidy payment from the government only if it furthers

the goals of universal service by genuinely making the basic set

of supported services available to everyone in a high cost area.

In short, Congress did not intend to have subsidies paid to

carriers who, through restricted advertising or other stratagems,

attempted to attract only those profitable customers at the high

end of the revenue spectrum.

In addition to Congress' vision with respect to the

preservation and advancement of universal service, the South

Carolina General Assembly (through S.C. Code Ann. § 58-9-280) has

required the Commission to "establish a universal service fund

(USF) for distribution to a carrier(s) of last resort" so as to

continue "South Carolina's commitment to universally available

basic local exchange telephone service at affordable rates and to

assist with the alignment of prices and/or cost recovery with

costs."

In its May 8, 1997 Universal Service Order, the FCC

attempted to implement the commands of Section 254 by

establishing a new federal system for supporting the costs of

universal service. Following the direction of Section 254(c)(1),

the FCC first established a definition of the basic services that

would be supported by the new federal funding mechanism. The FCC

thus specified a list of basic services--including voice grade

access to the public switched network, access to operator

services, access to long distance or "interexchange" service, and

access to directory assistance--as the set of supported services under the Act. Id. at ¶ 56.

One of the most important issues that the FCC had to address was how it would calculate the cost of providing universal service. In other words, the FCC had to determine the size of the implicit subsidy flow built into current rates that allows ILECs to maintain low charges for basic service. The FCC first ruled that, in determining the size of the subsidy, it would rely on projections of so-called forward-looking economic costs. Id. at ¶ 224. The FCC's particular version of a forward-looking cost measure purports to project how much it would cost today to build and operate a network to provide the services in question using the most efficient technology available.

The FCC gave the states the opportunity to submit a cost model for use in calculating interstate support for non-rural ILECs serving rural, insular and high cost areas in their respective states. However, to obtain federal universal service funding based on a state-selected cost model, that model must meet the following criteria:

1.   The technology assumed in the cost study or model must be the least-cost, most efficient, and reasonable technology for providing the supported services that is currently being deployed.

2.   Any network function or element, such as a loop,
      switching, transport or signaling, necessary to produce
      supported services must have an associated cost.

3.   Only long-run forward-looking economic cost may be
      included.

4.   The rate of return must be either the authorized
      federal rate of return on interstate services,
      currently 11.25 percent, or the state's prescribed rate
      of return for intrastate services.

5.   Economic lives and future net salvage percentages used
      in calculating depreciation expense must be within the
      FCC-authorized range.

6.   The cost study or model must estimate the cost of
      providing service for all businesses and households
      within a geographic region.

7.   A reasonable allocation of joint and common costs must
      be assigned to the cost of supported services.

8.   The cost study or model and all underlying data,
      formulae, computations, and software associated with
      the model must be available to all interested parties
      for review and comment.

9.   The cost study or model must include the capability to
      examine and modify the critical assumptions and
      engineering principles.

10.   The cost study or model must deaverage support
      calculations to the wire center serving area level at
      least, and, if feasible, to even smaller areas such as
      a Census Block Group ("CBG"), Census Block ("CB"), or
      grid cell.

Id. at ¶ 250.

After deciding upon a methodology for determining the

overall size of universal service costs that required support

from a subsidy source, the FCC decided to construct the federal

universal fund to cover only 25 percent of those costs. The FCC

explained that under the current separations process, roughly 25

percent of the costs of the local loop are assigned to the

interstate jurisdiction and, therefore, the new federal fund

would cover only 25 percent of the total cost of subsidizing

universal service. Unless this determination is reversed through

a pending appeal of that order, the states must fund the

remaining 75 percent of these costs above the FCC's arbitrary

revenue benchmark. Id. at ¶ 269.

The States had a deadline of April 24, 1998 to submit to the

FCC a cost model for use by the FCC in calculating federal

support for non-rural ILECs serving rural, insular and high cost

areas. Distributions from the federal fund will begin January 1,

1999. If a state-selected study fails to meet the FCC's

criteria, or if a state fails to submit a study, the FCC will

itself determine the interstate portion of the universal service

subsidy for that state according to the FCC's own forward-looking

cost methodology. The FCC is currently evaluating various cost

models for this purpose; however, it has not yet selected a

model.

The FCC's criteria are binding for _federal_ universal service

funding support only. However, although this Commission realizes

that it is not bound by these criteria when establishing its

intrastate universal service fund, it finds that the criteria are
reasonable and that using the same cost model and cost
methodology to calculate both the federal and state fund will
simplify the state fund calculation. Furthermore, if the
Commission does not select a model consistent with the FCC's
criteria for determining the federal cost of universal service,
then the amount of federal support for South Carolinians will be
determined by a federal model based upon national average default
inputs. Such a model could not possibly provide as accurate a
view of the universal service requirements in South Carolina as
would a model developed with inputs specific to South Carolina.
This Commission is best suited to determine which model and
inputs best calculate the cost of providing universal service in
South Carolina.

In the instant proceeding, therefore, the Commission has
selected an appropriate cost model and inputs that can produce
reasonable cost estimates of providing universal service in South
Carolina and that can meet the FCC criteria for calculation of
the appropriate level of support from the federal high cost fund.
The selection of this correct cost proxy model and inputs will
ensure that the actual cost of providing high quality local
exchange service to rural areas is accurately estimated.
Further, it will ensure that access to basic local service is

maintained even as local exchange competition erodes the implicit

subsidies that historically have been used to maintain affordable

rates for rural subscribers. Moreover, the Commission concludes

that the selection of the correct cost proxy model and inputs

will encourage CLECs to develop business plans that serve rural

South Carolinians and will provide incentives to ILECs to

continue to make capital investments in their high cost serving

areas of this State.

The parties to this proceeding have presented the Commission

with two cost proxy models to consider as well as various sets of

cost inputs to those models. The ILECs--BellSouth, United, and

GTE--contend that the Benchmark Cost Proxy Model Version 3.1

(BCPM 3.1) and the South Carolina company-specific inputs

submitted for use in that model produce the best estimation of

universal service costs in their territories in South Carolina.

Likewise, AT&T and MCI submit that the Commission should adopt

the Hatfield Model Version 5.0a (HM 5.0a) as the correct cost

proxy model for estimating the cost of providing universal

service in South Carolina.

In general, cost proxy models are used to provide reasonable

cost estimates when it is not possible to specifically identify

the cost of serving individual customers. A determination of

costs at the appropriate geographic level is more effectively

accomplished with a proxy model than by attempting to determine the cost of serving each individual customer. Therefore, both BCPM 3.1 and HM 5.0a provide estimates of the cost of providing universal service in South Carolina by approximating the cost of serving actual subscribers rather than attempting to define the cost of serving each individual subscriber.

The Commission finds that it is axiomatic that if new entrants are to enter rural markets, they must have a vehicle that allows them to recover their costs of service and yet still compete successfully against ILEC rates that are below cost. A properly sized universal service fund is that vehicle. If the fund is properly sized, new entrants will have the appropriate incentives to bring the benefits of competition to rural customers. If the fund is undersized, the Commission concludes that rural South Carolinians will undoubtedly suffer. Without a method to recover their costs, CLECs will have no incentive to enter high cost areas. Moreover, infrastructure investment by ILECs will decline, because those firms will no longer have the means by which to recover additional capital improvements in high cost areas. Customers in high cost areas will inevitably see declining service quality relative to lower cost areas and will not have the same access to advanced telecommunications services and information services as do lower cost customers. ILECs will

lose the lower cost, high margin customers to competition and will be left to serve predominantly high cost, low margin customers.

Ultimately, because only the low margin customers will be left to cover the full cost of the network, prices for those predominantly high cost customers will have to increase, thus jeopardizing the availability of universal service in this State. Therefore, the Commission has selected the cost proxy model and inputs it believes will best ensure that South Carolinians in rural and other high cost areas will realize the benefits of competition in the local exchange marketplace and will continue to enjoy high quality service from their provider of choice.

Finally, as was made clear by Mr. Varner and Mr. Oliver during the November 1997 hearings, we wish to reiterate this proceeding is not a rate case. The whole purpose of establishing a universal service fund is to ensure that basic local exchange rates will remain affordable. The Commission's own guidelines referenced above state that for every dollar of funding an eligible carrier receives from the universal service fund, that carrier's rates will be reduced by that amount of money.

IV. FINDINGS AND CONCLUSIONS

A. BCPM 3.1 More Accurately Locates Customers In Rural and Other High Cost Areas In South Carolina Than Does HM 5.0a.

A cost proxy model that estimates the cost to serve rural areas must be able to locate telephone customers with a reasonable degree of accuracy in those areas. The ability to reasonably estimate the cost to serve "high-cost" areas is an essential characteristic of a model that is used to determine the required funding for state and federal universal service programs.

Both BCPM 3.1 and HM 5.0a use the Census Block as the starting point for their customer location methodologies. The Census Block is the finest level of geography for which Census data is provided, such as housing units. Census Blocks are areas bounded on all sides by visible features such as streets, roads, streams, and railroad tracks, and by invisible boundaries such as city, town, township, and county limits, property lines, and short, imaginary extensions of streets and roads. (Tr. Vol. III at 252-253). The U.S. Bureau of the Census provides housing unit counts at the Census Block and Census Block Group level. A Census Block Group is a collection of Census Blocks generally containing between 250 and 550 housing units, with an ideal count

of 400 units. On average, there are 31 Census Blocks in a Census

Block Group. (Id.)

In urban areas, Census Blocks are fairly small. For

example, in a downtown area, they tend to be 0.005 square miles

in size. In a typical suburban area, they tend to be in the 0.5

to 1.0 square mile range. In rural areas, however, Census Blocks

tend to be much larger. Census Blocks as large as 60 square

miles are not uncommon, with 20 square miles being more typical.

(Tr. Vol. III at 253). Thus, a cost proxy model's customer

location methodology for placing customers within a Census Block

is much more critical in rural, low density areas.

The first step in accurately establishing customer locations

is the specification of the appropriate wire center boundaries.

BCPM 3.1 relies on publicly available wire center boundary data

obtained from Business Location Research ("BLR"). (Tr. Vol. III

at 247). Next, a BCPM 3.1 customer location algorithm partitions

the area of a wire center into "microgrids," roughly 1,500 feet

by 1,700 feet in size (0.09 square miles). Thus, each Census

Block within the serving wire center is overlaid with microgrids,

unless the entire Census Block falls within a single microgrid.

(Tr. Vol. III at 257).

In the rural areas of the wire center, the allocation of

customer locations is based upon the road network, the location

of which is known in every Census Block.   BCPM 3.1 uses data on

the road network obtained from TIGER/Line files ("Topologically

Integrated Geographic Encoding and Referencing") from the U.S.

Census Bureau. (Tr. Vol. III at 247).   In dense urban areas,

Census Blocks may be smaller than the microgrid, and the

assignment of customer data along the road network is not

required.   Because the Census Block road network is known with

certainty and because people tend to live along roads, BCPM 3.1

apportions Census Block housing units to microgrids based on the

share of the Census Block's road mileage that occurs in a given

microgrid. (Tr. Vol. III at 257).

These microgrids are then aggregated into telephone

engineering Carrier Service Areas ("CSAs") and Distribution Areas

("DAs"), as appropriate.   These are referred to as "ultimate

grids."   The maximum size of an ultimate grid is constrained to

approximately 12,000 feet by 14,000 feet (roughly six square

miles) to comport with engineering guidelines. (Id.)   BCPM 3.1

does not assume that customers are uniformly distributed within

each ultimate grid.   Rather, each ultimate grid is divided into

four distribution quadrants, each of which may contain a

distribution area.   The latitude and longitude coordinates of the

distribution quadrants are determined by first establishing the

road centroid of the ultimate grid.   The distribution quadrants

are centered on this road centroid. For those distribution

quadrants that do not have any customers assigned to them, no

distribution area is designed within the distribution quadrants,

thus ensuring that plant is not "built" in non-populated areas.

(Tr. Vol. III at 258).

For each populated distribution quadrant, the total area

that falls within a 500-foot buffer along each side of the roads

within that distribution quadrant is calculated. The DA is

modeled as a square whose size is equal to the total road buffer

area. The center of each distribution quadrant's square DA is

placed at the road centroid of the distribution quadrant. The

above-described approach provides a reasonable model of the

required telecommunications network facilities for two reasons.

First, households and businesses typically are located near roads

and centering the distribution quadrant of the DA at the center

of the roads establishes network facilities closer to where

customers are located. Second, rights-of-way for

telecommunications structures generally exist near roadways.

This approach reduces requisite network facilities, given

customers' actual location. (Tr. Vol. III at 258).

In sum, the Commission finds that BCPM 3.1's customer

location algorithm yields an accurate picture of where telephone

customers are actually located in South Carolina's rural areas.

It is undisputed, moreover, that these high-cost, rural areas
will most need support from the federal and state universal
service funds.

In contrast to BCPM 3.1, HM 5.0a attempts to use "geocoding"
to locate customers within Census Blocks. The geocoding process
is performed by PNR and Associates ("PNR"). PNR obtains customer
addresses within a Census Block from Metromail, Inc., Dun &
Bradstreet, and other commercial providers of mailing addresses
and then spatially locates customers on a street map of the
Census Block using latitude and longitude coordinates. The PNR
database is provided as a finished product to the Hatfield
developers, who then run HM 5.0a using the PNR data. (Wood Ex.
DJW-2). As shown below, although reasonably accurate for usage
in dense, urban areas, the geocoding process is grossly
inadequate for the large, rural areas that are at the core of
this Commission's universal service inquiry.

In an ex parte filing with the FCC dated February 3, 1998,
MCI conceded that HM 5.0a had little success with geocoding rural
customers. (Tr. Vol. III at 263; Exh. 29). In the filing, MCI
provided the success rate, by density zone within each state, for
the geocode data in HM 5.0a. MCI reported that:

> [t]he data indicate that the greatest success in
> geocoding customer locations was in the middle
> density zones (between 200 and 2550 customer

locations per square mile), with <u>lower</u> <u>success</u>
<u>rates</u> <u>at</u> <u>the</u> <u>higher</u> <u>and</u> <u>lower</u> <u>density</u> <u>zones</u>.
(emphasis added).

For South Carolina, MCI reported an average geocode success rate

of only 72 percent, meaning that the geocode process could

spatially locate on a street map less than three-quarters of

actual customers. It further reported geocode success rates of

only 28 percent in the lowest density zone and 53 percent in the

next-to-lowest density zone. The Commission finds that the

geocoding process experiences poor success rates in less-densely

populated areas for the reasons discussed below.

Metromail, which provides the residential addresses for use

in geocoding, does not provide 100 percent coverage of housing

units in the United States. Metromail compiles addresses from

telephone directory white page data. The Metromail database does

not contain addresses for households that simply list their name

and number in the white pages, nor does it include non-published

phone numbers and addresses. As a result, the Metromail database

contains only 64.8 percent of the potential addresses necessary

to spatially locate all of the existing housing units in the 50

states. (Tr. Vol. III at 254-55).

The Commission concludes that the Metromail database that HM

5.0a relies upon for "accurate" geocoding is incomplete and

cannot be reliably used to locate customers in rural areas in South Carolina.

Not only is the Metromail database incomplete, not all customer locations can be geocoded. For example, as Dr. Duffy-Deno testified, P.O. Box and Rural Route addresses cannot be geocoded. (Tr. Vol. III at 255). Because P.O. Boxes and Rural Route addresses occur more frequently in rural areas, HM 5.0a's inability to geocode these customers is more pronounced in rural areas than it is in urban areas. Further, customers may not be geocoded because of a missing street or road in the road network database. (Id.)

Importantly, even when customers can be located through geocoding, the precise locations of customers are not used in HM 5.0a to build telephone plant to serve them. According to the HM 5.0a documentation, once customers are geocoded, they are grouped into one of two types of clusters. A "main cluster" contains the bulk of the customer locations. "Outlier clusters" contain one to five locations. These outlier clusters are attached to a given main cluster and are connected by network facilities both to each other and to the main cluster on which all the associated outlier clusters "home." It is these clusters that HM 5.0a relies upon to "build" outside plant to actually serve customers.

After the clusters are formed, the geocoded information is

discarded. (Tr. Vol. III at 256, 281).

As acknowledged by AT&T witness Mr. Pitkin, customer

locations that cannot be geocoded are arbitrarily placed (i.e.,

assumed to exist) on the perimeter of the Census Block in which

they are located. (Tr. IX at 123). These customer locations

placed on the Census Block boundary are called "surrogate"

locations. HM 5.0a places these "surrogate" customers on the

Census Block boundary because it assumes that there may be a road

on the perimeter of the Census Block. (Tr. Vol. IX at 123-27).

However, the Commission can find no compelling evidence in this

record that shows a strong relationship between Census Block

boundaries and roads in South Carolina. As stated above, Census

Blocks may be bounded by many things--visible and invisible--

other than roads. Moreover, Dr. Duffy-Deno testified that in

South Carolina, 30 percent of the roads are interior to Census

Blocks. (Tr. Vol. III at 280-81).

By placing unknown customer locations on the Census Block

boundary, HM 5.0a ignores the common sense understanding that

people live along roads. On average, there is no reason to

conclude that customers are more likely to live on exterior roads

than on any other roads, including interior roads. The

Commission concludes that a cost proxy model like HM 5.0a that

assumes that unknown people (surrogate geocoded locations) live

on unknown roads (along the Census Block perimeter) simply cannot

be the basis for calculating the investment needed to provide

universal service in South Carolina.

To demonstrate the inadequacies of geocoding, INDETEC

performed an empirical analysis that confirmed that large numbers

of customers cannot be located by geocoding in rural areas in

South Carolina. (Tr. Vol. III at 261). INDETEC examined the

geocode success rate for three rural South Carolina counties--

Bamberg, Edgefield and Marion. All three counties are

characterized by low housing unit densities, i.e., less than 35

housing units per square mile. The extremely low percentages of

Census housing units that could be geocoded were as follows:

Bamberg--27.93 percent; Edgefield--23.81 percent; and Marion--

32.5 percent. (Id.)

Moreover, HM 5.0a's clusters do not include all populated

Census Blocks in South Carolina. Exhibit KDD-5 to Dr. Duffy-

Deno's testimony shows that HM 5.0a's clusters fail to serve any

households in 6,558 populated Census Blocks in this State. The

unserved Census Blocks amount to almost 7.2 percent of the total

populated Census Blocks in South Carolina and account for nearly

3.5 percent of the Census households in this State. In practical

terms, HM 5.0a's clusters leave at least 46,399 households in

South Carolina without the possibility of receiving telephone service. (Tr. Vol. III at 263-64).

The size and shape of the HM 5.0a's clusters also reflect fundamental flaws in the model's logic that make serving actual customers almost impossible. In the Bamberg, Edgefield and Marion wire centers, 22 of the 47 main clusters are greater than 9 square miles in size. For the entire state of South Carolina, 32 percent of the main clusters are greater than 9 square miles and the largest cluster is 21 square miles. (Tr. Vol. III at 263-64). By comparison, the largest BCPM grid in South Carolina is just under 9 square miles and 97.6 percent of the BCPM 3.1 grids are smaller than 7 square miles. (Id.)

However, no matter the size of a cluster, HM 5.0a always assumes that customers are evenly distributed within each cluster. The Commission concludes that assuming an even distribution of customer locations, for example, over a 21-square mile area cannot realistically predict the investments necessary to actually serve those customers.

Unlike the HM 5.0a assumption, BCPM 3.1 does not assume that customers are evenly distributed within its grids but, instead, further locates these customers using the logical assumption that people tend to live along roads. (Tr. Vol. III at 264). INDETEC studied the relationship between the number of housing units in a

Census Block and the total road miles in a Census Block and found

a reasonably high correlation. (Tr. Vol. III at 265).

Specifically, INDETEC studied such correlations for four density

zones in South Carolina less than 200 housing units per square

mile. The correlations were all positive (generally close to 1),

thus indicating a strong association between housing unit

locations and road miles. (Id.)

In sum, the Commission finds that a large percentage of

customer addresses that can be accurately geocoded are in urban

areas. However, in urban areas (where Census Blocks tend to be

small) there is little to be gained in terms of cost estimation

by geocoding those addresses. In contrast, in rural areas (where

Census Blocks tend be large), reasonably locating customers

within the Census Block is critical to a proper estimation of the

cost of serving rural customers.

Because successful geocoding in rural areas tends to be low,

the HM 5.0a's customer location algorithm is reduced to

allocating most customer locations to the perimeter of Census

Blocks, regardless of where those customers are located.
Because the Census Block road network is known with certainty and

people tend to live along roads, BCPM 3.1's algorithm yields a

more accurate picture of where telephone customers actually live

in rural areas. For all the above-stated reasons, the Commission

concludes that BCPM 3.1's road-based customer-location

methodology is superior to HM 5.0a's and, therefore, more

accurately estimates the cost of providing universal service in

South Carolina.

B.   BCPM 3.1 Designs A Network Superior To That Designed By HM 5.0a.

In addition to the question of how well each model locates

customers in rural areas, another critical issue in this

proceeding is the reasonableness of the network design

incorporated in each model. The Act's universal service goal

will not be met by a low-cost telephone network that provides

marginal voice grade services, but fails to provide minimal

access to data and other advanced services. Section 254 requires

that federal and state universal service policies should assure

that 1) quality services are available at just, reasonable, and

affordable rates; and 2) consumers in all regions, including

those in rural and high cost areas, have access to advanced

telecommunications and information services comparable to those

provided in urban areas. As set forth below, the Commission

finds that BCPM 3.1 is best designed to meet the universal

service goals of Congress, the FCC and the General Assembly.

Dr. Robert M. Bowman testified on behalf of BellSouth and

United on the engineering aspects of BCPM 3.1. Dr. Bowman earned

Bachelor, Masters and Ph.D degrees in electrical engineering and

has 28 years of telecommunications experience with Bell Labs and

US WEST Communications. Dr. Bowman has personally developed

models that calculate the cost of outside plant design. (Tr. Vol.

IV at 41).

As Dr. Bowman noted, the great majority of the costs of

providing universal service are the costs of constructing and

maintaining the loop network. (Tr. Vol. IV at 46). The loop

network consists of the facilities from the central office

switching center to the customer's premise. The loop includes

feeder cable, distribution cable, Feeder Distribution Interfaces

("FDIs"), distribution terminals, drop wire and Network Interface

Device ("NID") at the customer's premise. The facilities between

the switching center and the terminal at the customer's premise

are typically divided into feeder and distribution cable plant.

Feeder facilities are the facilities between the switching center

and the FDI.

An FDI is generally the demarcation point between feeder and

distribution facilities. Distribution facilities begin at the

FDI and end at the NID or at a building terminal. A distribution

terminal (drop terminal) is used to terminate drop wire and

connect the drop wire to the distribution cable. Drop wire

connects the distribution cable to the network device located at

the customer's premises. (Tr. Vol. IV at 47). A sound cost proxy model must design a network that includes all the loop cost elements necessarily incurred in providing customers with the capability of placing and receiving telephone calls.

While AT&T witness Wells generally averred that HM 5.0a followed standard engineering design rules, he could not cite to any specific engineering practice or standard to substantiate his claim. (Tr. Vol. IV at 55). As Dr. Bowman testified, HM 5.0a does not comport with the engineering guidelines and practices published by Mr. Wells' own employer--AT&T. (Id.) AT&T's "Outside Plant Engineering Handbook, August 1994" (reprinted under the Lucent label in 1996) generally limits copper loops beyond the Digital Loop Carrier Remote Terminal ("DLC") to 12,000 feet for quality service. BCPM 3.1 followed this engineering practice in its network design by using larger 24-gauge cable beyond 11,100 feet and replacing standard channel unit cards with extended range line cards beyond 13,600 feet. (Tr. Vol. IV at 57).

HM 5.0a, on the other hand, violates this standard by extending copper loops beyond the DLC up to 18,000 feet without additional provisions, such as extended range channel unit cards. HM 5.0a places standard channel unit cards (plug-ins) in its DLC, which are less expensive than the extended range cards. (Tr. Vol.

IV at 55-57; BellSouth Late Filed Exh., 4-3-98). The Commission

finds that HM 5.0a models copper distances that are not supported

by the technology assumed, thus underestimating the actual cost

of providing quality telephone service. As reflected by Bowman

Exhibit RMB-2, it is more economical to place additional DLC than

it is to use expensive extended range line cards to extend copper

loop length. (See also BellSouth Late Filed Exh., 4-3-98)

Furthermore, as noted by Dr. Bowman, the use of these standard

channel unit cards, combined with the distance of the loop past

the DLC, results in an unacceptable decibel loss on the loop.

(Tr. Vol. IV at 56-57).

Not only does HM 5.0a's use of standard channel cards on

loops that extend to 18,000 feet violate the AT&T OSP handbook,

it is also not consistent with the guidelines published by the

manufacturer of the DLC assumed by both models to be used in the

network, the Litespan 2000. The Litespan guidelines describe

limitations on loop lengths and the need for extended range line

cards for loops beyond 12,000 feet. (Tr. Vol. IV at 57).

Finally, from a network design perspective, the Commission

agrees with Dr. Bowman that not all of the HM 5.0a engineering

assumptions are obvious to the user nor can they readily be

changed. For example, HM 5.0a does not place telephone poles as

a part of the model's aerial structure in the two highest density

zones. (Tr. Vol. IV at 52-54). Not only is this assumption not

obvious to the user, there is no user-adjustable input that

allows the user to provide for placement of poles as part of the

aerial structure in these two density zones. The user must not

only search through the Excel formulas to discern exactly how

structure is treated, but also must modify the Excel formulas to

incorporate a more realistic assumption. (Id.) Moreover,

exclusion of poles in the two highest density zones is an

important omission from a cost perspective. HM 5.0a assumes that

as much as 60 percent to 85 percent of loop plant is aerial in

its two highest density zones. However, by assuming no poles,

the model only includes the material cost of the cables. This

likely results in an understatement of structure costs in the

high density zones, especially given HM 5.0's assumption of such

a high percentage of aerial plant. (Id.)

A second HM 5.0a engineering assumption that is difficult to

identify and then change involves the omission of manholes,

handholes and pullboxes in distribution plant. (Tr. Vol. IV at

54-55). The Commission agrees with Dr. Bowman that it is

unrealistic to assume that distribution manholes, handholes and

pullboxes are not required in a universal service cost proxy

model. Larger cable sizes in dense urban areas are often too big

to sweep up from beneath the ground and attach to pedestals on

the surface. Manholes, handholes, and pullboxes are frequently required to build distribution plant in urban areas. Omitting them entirely from HM 5.0a fails to recognize requisite costs incurred to serve urban subscribers. The model lacks user-adjustable input tables that permit the user to easily add such items of structure to the distribution plant. Therefore, unless a user is capable of altering the model's computer programming, the model automatically substantially understates underground conduit costs in distribution plant. (Id.)

In conclusion, after careful consideration of the evidence presented on this subject, the Commission concludes that BCPM 3.1's network design is superior to HM 5.0a's because it follows industry-accepted design standards; builds a network that reaches all customers--existing and potential; makes advanced services as available to rural customers as they are to urban customers; and builds a high quality network over which urban and rural South Carolinians can actually talk. We therefore adopt BCPM 3.1 as the State forward-looking cost model for BellSouth, GTE South, Inc. and United Telephone Company of the Carolinas.

C. The Cost Inputs Proposed By BellSouth, GTE South and United
For Use In BCPM 3.1 Will Enable The Commission To Accurately
Estimate The Cost Of Providing Universal Service In The
Companies' South Carolina Service Areas.

Although the selection of the proper cost model is
important, the Commission believes that selection of the
appropriate model inputs that result in an accurate determination
of the "real world" costs of providing universal service in high
cost areas is just as critical. In addition to the state-
specific model inputs for Census data and terrain information,
cost inputs should reflect the costs that an efficient carrier
will incur in providing universal service in South Carolina. A
cost model's inputs must be capable of not only determining the
cost for a specific state, it must also be capable of determining
how those costs vary from area to area within that state.

Ms. Daonne Caldwell's testimony explained why the inputs
proposed by BellSouth comply with FCC requirements and will
enable the Commission to accurately determine the costs of
universal service in South Carolina. (Tr. Vol. V at 100-119). In
its Universal Service Order (¶ 250), the FCC identified ten
criteria that "all methodologies used to calculate the forward-
looking economic cost of providing universal service in rural,
insular, and high cost areas must meet." The first criterion
requires that "[t]he technology assumed in the cost study or

model must be the least-cost, most-efficient, and reasonable

technology for providing the supported services that is currently

being deployed." Id. Moreover, although costs cannot be

embedded costs, the model "must be based upon an examination of

the current cost of purchasing facilities and equipment, such as

switches and digital loop carriers (rather than list prices)."

Id.

As discussed in more detail below, the Commission concludes

that BellSouth's inputs to BCPM 3.1 reflect the costs of

currently available technologies for BellSouth territory.

BellSouth used current material prices, labor costs, and

contractor costs that are adjusted by Telephone Plant Indices

("TPIs") to reflect 1997-1999 costs. In certain plant accounts,

the TPIs add inflation estimates to the costs. In other

accounts, the TPIs actually result in lower costs when costs are

forecasted to decline in a particular type of telephone plant.

In other words, BellSouth's cost inputs do not reflect embedded

costs. While they take into consideration the actual costs

incurred today by BellSouth, they are adjusted to reflect cost

changes projected over the next three-year period. These

adjustments include inflation, deflation, and productivity gains.

Both HM 5.0a and BCPM 3.1 require thousands of input items

ranging from the material price of cable to Census data on

households. The input data can be classified into two broad categories: external inputs and user-adjustable inputs. The external inputs include items like soil type, number of households, and topography. These inputs are generally the same for both models. The user adjustable inputs include such things as prices of cable, fill factors, plant mix, structure sharing, financial parameters and expenses. (Tr. Vol. VI at 520).

BCPM 3.1 contains default values for approximately 12,000 user adjustable inputs. These default values represent national averages based upon survey results from many companies. (Tr. Vol. VI at 522). However, the user has the option of replacing the default input values with user-specific values. For the overwhelming majority of user adjustable inputs, BellSouth supplied inputs specific to its service territory in South Carolina. (Id.) When BellSouth data was not available in the format or in the level of detail required by the model, BellSouth drew upon its own experience and company data to verify the reasonableness of the default values. Although approximately 50 default values were not verified, BellSouth did determine that those inputs would not have a significant impact on the cost per loop generated by the model. (Id.)

In addition to Ms. Caldwell's testimony addressing the appropriateness of all of BellSouth's inputs, BellSouth also

submitted the testimony of Dr. Billingsley n the issue of cost of

capital and Mr. Cunningham on the issue of depreciation. With

respect to cost of capital (FCC criterion No. 4), BellSouth used

the FCC's overall recommended cost of capital of 11.25 percent

but used its own capital structure components. (Tr. Vol. V at

110). Because the FCC's prescribed capital structure is set at a

nationwide level, BellSouth correctly concluded that it would be

inappropriate to use that nationwide capital structure in a South

Carolina-specific universal service cost model.

Dr. Billingsley tested the reasonableness of BellSouth's

overall cost of capital of 11.25 percent by using two different

sets of assumptions—one using BellSouth's reported capital

structure and embedded cost of debt of only 6.36 percent, and the

second using an equity ratio of 60 percent and a current forward-

looking cost of debt of 6.90 percent. (Tr. Vol. II at 47-50).

Based upon his cost of equity estimates of 14.66 to 15.24 percent

for BellSouth and the use of the above tests, Dr. Billingsley

correctly concluded that the use of an 11.25 percent overall cost

of capital by BellSouth is reasonable and conservative. (Id.)

With respect to the depreciation issue (FCC criterion No.

5), Mr. Cunningham described the asset lives that were developed

and provided for use in BCPM 3.1. (Tr. Vol. II at 52-75). These

represent BellSouth's expected economic lives for newly placed

plant. Mr. Cunningham asserts that economic lives, as opposed to prescribed lives, are the appropriate lives to be used in depreciation calculations in a forward-looking cost study. Lives were last prescribed by the FCC for South Carolina in 1995 and are much too long, particularly for technology sensitive accounts. (Tr. Vol. II at 55). They were based on the old regulatory paradigm in which plant lives were artificially lengthened beyond their true economic lives so that the investment in that plant would be recovered over long periods of time. Today's competitive marketplace will not allow BellSouth to recover investment based on lives that are inappropriately long.

Economic lives reflect the useful (revenue producing) life of an item of plant and are appropriate for use in economic cost studies to ensure that costs are recovered over a time period equal to the revenue-producing life of the plant. Furthermore, the economic lives used in BellSouth's BCPM 3.1 study and the lives used to determine the depreciation rates currently booked in South Carolina for intrastate and for public reporting purposes are the same for most accounts, i.e., approximately 93 percent of BellSouth's South Carolina investment. (Tr. Vol. II at 62).

After careful consideration, the Commission finds that the BellSouth-specific inputs (as modified by our decision on identical inputs in Docket No. 97-374-C) are the appropriate inputs to use in determining the costs of providing universal service in BellSouth territory in South Carolina. BellSouth has many years of experience building and operating a network that provides quality telecommunications service in this State. BellSouth engineers understand the area and the State-specific requirements. Moreover, BellSouth is a large purchaser of telecommunications equipment and, therefore, often receives volume discounts from vendors. The BellSouth inputs reflect a reasonable view of conditions and experiences that an efficient carrier would experience providing service in BellSouth's territory in South Carolina and, moreover, meet the ten criteria established by the FCC in its Universal Service Order.

Likewise, after due consideration of the evidence, we hold that GTE company-specific inputs are appropriate inputs to use for the BCPM 3.1 for GTE territory, and United company-specific inputs are appropriate inputs to use for the BCPM 3.1 for United territory.

However, all three sets of inputs, i.e., these for BellSouth, GTE, and United will be modified as appropriate to be

consistent with the following points:

1.   To the extent that TELRIC cost studies already include

a reasonable return on investment, it is not appropriate to

include any additional profit in the price of a service. (A

"reasonable return on investment" is defined as a company's

latest overall rate of return as approved by this Commission.)

2.   Utilize the depreciation rates which have been approved

by the Public Service Commission of South Carolina.

3.   At least, adopt fill factors for the Feeder System of

75%, and the Distribution System of 50%.

4.   Common cost estimates should be reduced to avoid the

potential for using common costs which are overstated. A common

cost factor of 4.79% should be utilized in any study.

5.   Residual cost recovery should be denied for unbundled

elements.

6.   Fall-out factors should be reduced to reflect a more

competitive environment. A fall-out factor of 5% should be used

in any study.

D. HM 5.0a's Default Inputs Do Not Accurately Reflect The Actual Cost Of Providing Universal Service In South Carolina.

Unlike the South Carolina-specific inputs that BellSouth

used in BCPM 3.1, the default inputs contained in HM 5.0a do not

contain information specific to this State and, accordingly,

cannot possibly accurately reflect the forward-looking cost of providing high quality telephone service to South Carolinians.

There are essentially two databases used in the HM 5.0a in this proceeding: 1) a voluminous set of cluster data concerning customer counts, locations and geophysical characteristics of the service territory; and 2) a set of data values that make up a user adjustable input database. The values for the cluster data are fixed and are not intended to be user adjustable. The values for the user adjustable inputs are designed to reflect the conditions of the carrier for which prices are being developed. (Tr. Vol. X at 68).

HM 5.0a's default values are generic in nature, national in scope and largely form the basis for AT&T and MCI model filings in numerous states across the nation. Therefore, the HM 5.0a default inputs, unless changed, are the same for South Carolina as they would be for every other state. (Tr. Vol. X at 92). With respect to the default user adjustable inputs in this proceeding, AT&T and MCI changed only three--cost of capital, depreciation, and the regional labor adjustment. (Id.) This approach to input development ignores South Carolina-specific operating conditions experienced by BellSouth and cannot reasonably reflect the universal costs in this State.

No witness other than AT&T's Mr. Wells offered testimony on how the HM 5.0a inputs recommended for use in South Carolina were developed. Even Mr. Wells could not offer supporting testimony for almost half of the user adjustable inputs, because he only had responsibility for those inputs related to outside plant. (Tr. Vol. VII at 86-87). Cross-examination of Mr. Wells, however, revealed an input calculation process that is fundamentally flawed. According to Mr. Wells, the outside plant inputs for HM 5.0a were developed by a team of "independent" experts who used their collective outside plant expertise and experience to develop the values. However, none of the team's opinions concerning engineering inputs were based on South Carolina-specific information. According to Mr. Wells, the team's "assumptions and input values are what we would call national values." (Tr. Vol. VIII at 92). Mr. Wells admitted that not only did his team not use South Carolina-specific information in forming their opinions, they did not contact contractors in South Carolina or check material prices in this State to verify if their assumptions were correct. (Tr. Vol. VIII at 92-94). Finally, Mr. Wells conceded that he could offer no personal knowledge of the origin of many of the outside plant inputs because they were developed prior to his joining the team. (Tr. Vol. VIII at 88-90).).

The Hatfield input team itself consists of two members who are AT&T employees and four consultants who are paid by AT&T and MCI. (Tr. Vol. VIII at 87-88). Any member of the team, according to Mr. Wells, has the power to reject inputs proposed by other team members. Thus, even if five team members strenuously believed than an input should be changed, one member could prevent the change if he desired. (Tr. Vol. VIII at 95-96). Under the circumstances, the Commission has serious doubts about the independence of the HM 5.0a outside plant input team.

Mr. Wells conceded that some of the input assumptions that the HM 5.0a makes have not been achieved by any telephone company today. (Tr. VIII at 110). He attempted to discount this admission by stating that the model assumes a future environment where a hypothetical, most efficient local exchange carrier operates in a competitive environment. (Tr. Vol. VIII at 110-111). However, even with that qualification, Mr. Well's testimony regarding the "future" use of buried structure sharing strains credulity.

HM 5.0a assumes that an ILEC will share buried support structures for distribution cable with other companies one-third of the time (a 33 percent sharing factor). This means that the ILEC would pay for only one-third of the total cost of this support structure and someone else would pay for the other two-

thirds. (Tr. Vol. VIII at 112). This sharing factor was developed by the input team prior to the time Mr. Wells joined it. (Id.) Moreover, Mr. Wells admitted that the team's validation process did not reveal a single telephone company in North America that had achieved a 33 percent sharing factor. (Tr. Vol. VIII at 114).

AT&T also offered the testimony of Art Lerma who recommended that the Commission adopt the operating expense inputs in HM 5.0a. (Tr. Vol. IX at 137-165). Although Mr. Lerma asked that the HM 5.0a operating expense inputs be adopted, he admitted that he was "not a Hatfield expert" and had "not analyzed the Hatfield Model." (Tr. Vol. IX at 172). Mr. Lerma further admitted that he had performed no review of his own of the operating expense inputs of the HM 5.0a to verify whether those inputs were reasonable or not. (Id.)

Nevertheless, Mr. Lerma asked the Commission to accept all the HM 5.0a operating expense inputs, including one that would reduce BellSouth's network operating expenses by 50 percent. Mr. Lerma testified that such a drastic reduction was feasible because of technological improvements, productivity gains and increased competition that could be expected in the future. (Tr. Vol. IX at 176). The Commission finds that the assumptions underlying Mr. Lerma's proposal to reduce network operating

expenses are simply unrealistic at this time, particularly his
assumption that competition in BellSouth's local exchange market
will logically drive this reduction. Mr. Lerma could not tell
the Commission when AT&T will ever be vigorously competing in
South Carolina local exchange markets, much less predict when
other firms would begin widespread competition here.

In addition to the flaws in the HM 5.0a input process
revealed in Mr. Well's and Mr. Lerma's testimony, BellSouth
presented the testimony of the Georgetown Consulting Group, which
examined whether the default values chosen by MCI and AT&T
reflected BellSouth's operations in South Carolina or reflected
cost or other considerations reasonably expected to occur in the
future. (Tr. Vol. X at 59-106).

For purpose of its analysis, Georgetown accepted the
underlying logic of HM 5.0a and focused its attention only on the
model's user adjustable inputs. In summary, Georgetown
identified groups of inputs that were related by the model's
logic and then tested the model's sensitivity to changes in the
values for the groups. The results of HM 5.0a were considered
sensitive to a group of inputs if a change in one or more of the
default values for the related inputs changed the average loop
price or switching price by one percent or more. (Tr. Vol. X at
66-67).

For the input groups considered sensitive, Georgetown

examined whether the default values chosen by MCI and AT&T

reflected BellSouth's operations in South Carolina and reflected

cost or other considerations reasonably expected to occur in the

future. When the default values for those groups of inputs

failed that standard, Georgetown fashioned alternative values to

meet it by examining current costs and other data specific to

BellSouth in South Carolina, stripping that information of any

embedded characteristics and creating the type of forward-looking

cost or other data that complied with the FCC's criteria for

development of cost proxy models. The default values selected

for fourteen groups of user adjustable inputs had a significant

effect on the results derived by applying HM 5.0a. (Id.).

The fourteen groups of related user adjustable inputs

encompassed about 70 of the 201 specific inputs examined.

Georgetown also tested to ensure that the insensitive inputs,

taken together, produced no significant change in the HM 5.0a

output by changing each default value in a direction that

decreased loop and switching prices. When all the changes were

run on a combined basis, the total loop and switching price

decreased by less than $1. (Tr. Vol. X at 69-71).

By changing the default values for these fourteen groups of

inputs to reflect South Carolina-specific data and then running

HM 5.0a with those new values, Georgetown produced an average

loop cost of $43.16, which is extremely close to the $41.11

average loop cost produced by BCPM 3.1 with the BellSouth-

specific inputs described in Ms. Caldwell's testimony. (Tr. Vol.

X at 73). The majority of the cost differential was attributed

to six of the categories: NID and drop--$1.92; distribution

investment--$9.17; structure sharing--$2.68; expense factors--

$1.61; cost of capital--$1.49 and depreciation--$1.16. (Id.).

Not all of the fourteen categories increased. In four loop

categories--terminal and splice; interoffice investment; copper

and fiber fill factors; and switching factors--Georgetown

actually decreased values from the levels recommended by HM 5.0a.

(Id.)

The Commission concludes that the sensitivity analysis

performed by Georgetown on the HM 5.0a default inputs

corroborates the appropriateness of using the South Carolina-

specific inputs recommended by Ms. Caldwell, and those

recommended by the other non-rural LECs, for use with BCPM 3.1.

E.   Embedded cost model is adopted for rural LEC's.

First, we must rule on the Consumer Advocate's objection to

admission into the record of Hearing Exhibit 14, the embedded

cost studies of the rural LEC's. The ground for said objection

is incompleteness. The objection is overruled and the Exhibit is

admitted into the evidence of this case. The conclusion is based on the following.

Cost experts at John Staurulakis, Inc. ("JSI") developed cost of service studies for residential and single-line business service for SCTC companies by obtaining information from each of the twelve SCTC cost companies (i.e., companies that file a cost study with the National Exchange Carrier Association for interstate settlement purposes.) Prefiled Direct Testimony of Douglas Meredith at 4. The remaining eleven SCTC companies are average schedule companies, which receive interstate settlements based on average schedule formula, i.e., they do not perform company-specific cost studies. Id.

The financial information obtained from the cost companies included booked investments amounts, including depreciation reserves, for investment under Part 32 Accounting rules. This financial information also included allowable expense amounts for the telecommunications activity of the company. Finally, information relating to the operation of the company that relate to how shared and common investments and expenses are allocated, and the usage of the network for various types of calling activity, was obtained. Id. at 4-5.

The actual cost information was allocated to department and then to functional components within department based upon the

information provided by the company. These functional components

were then combined to form a basic residential or business

service cost. Id. at 5. This procedure utilizes cost allocation

principles that are used in embedded cost methodologies. Id.

The eleven average schedule companies were assigned service

cost by calculating a weighted cost of service for all cost

companies. The weighting is based upon total residential and

business access lines used in the analysis. Id. This procedure

is consistent with state law, which provides "In the event that a

carrier of last resort does not currently conduct detailed cost

studies relating to such services, the Commission shall allow for

an appropriate surrogate for such study." S.C. Code Ann.§58-9-

280(E)(6).

The cost of basic service for the SCTC cost companies ranged

from $35.07 per month to $70.81 per month, and the weighted

average was $41.52 per month, as detailed in the testimonies of

SCTC witnesses Douglas Meredith and Azita Sparano. See Exhibits

to Prefiled Testimony of Douglas Meredith and Azita Sparano.

The embedded cost studies performed by JSI on behalf of the

SCTC were submitted for the record under seal, because disclosure

of the individual companies' cost information could put those

companies at a competitive disadvantage. The studies were made

available, upon request, to the Consumer Advocate's consultant

and to representatives of AT&T for review and comment. Hearing

Exhibit Number 14 in this proceeding contains the cost studies

(under seal), along with AT&T's Comments on the studies and

SCTC's Reply Comments, which were filed pursuant to the

Commission's ruling at the hearing on this matter.

The SCTC's embedded cost studies present actual costs of the

SCTC cost companies. The weighted cost used for the average

schedule companies is a reasonable surrogate for actual costs in

the absence of cost studies for these companies, which tend to be

the smaller companies in the state. Mr. Thomas Hyde, who

testified on behalf of MCI Telecommunications, Inc. in this

matter, stated that "the cost per line appears to be reasonable

for rate of return based embedded costs." Prefiled Direct

Testimony of Thomas Hyde at p. 3. The Consumer Advocate's

objection is overruled and the Exhibit is admitted.

The Federal Communications Commission ("FCC") has recognized

that rural carriers may be disproportionately affected by a

change in universal support mechanisms and, for this reason, it

is appropriate to allow rural carries to continue to receive

support based on embedded cost for at least three years. In re:

Federal-State Join Board on Universal Service, CC Docket No. 96-

45, FCC 97-157 (May 8, 1997) at para. 294. Once forward-looking

methodologies are in place for non-rural carriers, the FCC will

evaluate mechanisms for rural carriers. Id. Any subsequent

shift to a different support mechanism will be gradual, to allow

rural carriers ample time to adjust to any changes in the support

calculation. Id.

South Carolina state law, consistent with federal law, also

allows rural carriers to use embedded cost studies. S.C. Code

Ann. §58-9-280(J) provides:

> Subject to the requirements of applicable federal
> law, a small LEC [defined in §58-9-10(14) to mean
> a rural telephone company as defined in the
> federal Act] may define the term "cost" as used
> within this section and where applicable to a
> small LEC, to include all embedded costs as well
> as a reasonable contribution to universal local
> service, where applicable, until such time as
> these costs are recovered from other sources.

In accordance with the FCC's position for rural carriers and

in accordance with state law, the SCTA has proposed that the

Commission adopt State USF Guidelines that would allow rural

telephone companies to use an embedded cost methodology to

determine their universal service costs until such time as the

FCC adopts federal guidelines for rural local exchange carriers.

Accordingly, we hereby adopt the embedded cost model

proposed by SCTC, including recommended inputs, related to cost

recovery by rural local exchange companies in South Carolina.

IT IS THEREFORE ORDERED THAT:

1.   The Benchmark Cost Proxy Model (BCPM) 3.1 is hereby adopted as the State forward-looking cost model for BellSouth, GTE South, Inc., and United Telephone Company of the Carolinas.

2.   Company-specific inputs as recommended by BellSouth, GTE South, Inc., and United Telephone Company of the Carolinas are adopted for use in the BCPM 3.1 for use in the companies' respective service areas. These inputs will be modified as appropriate to be consistent with the Commission decision in Docket No. 97-374-C, the Proceeding to Review BellSouth Telecommunications, Inc.'s cost studies for unbundled network elements, said points as listed herein.

3.   The embedded cost model proposed by South Carolina Telephone Coalition, including recommended inputs, related to cost recovery by rural local exchange companies in South Carolina is hereby adopted for the rural local exchange companies in South Carolina.
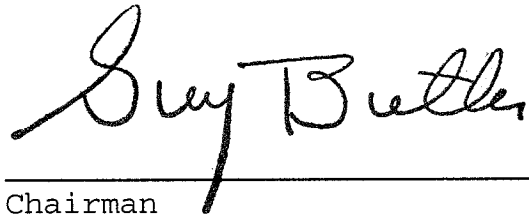
4.   All other matters related to the intrastate universal service fund and not ruled upon herein are held in abeyance.

5.   This Order shall remain in full force and effect until

further Order of the Commission.

BY ORDER OF THE COMMISSION:

_____
Chairman

ATTEST:

_____
Deputy Executive Director

(SEAL)